WHAT IS CLAIMED IS:

1. A process for producing a cathode electroactive material for use in lithium ion secondary cells predominantly comprising an Li-Mn composite oxide with the spinel structure, which comprises adding, to a pulverized Li-Mn composite oxide with the spinel structure, an oxide which is molten at 550°C-900°C: an element which forms the oxide: a compound comprising the element: an oxide which forms a solid solution or melts to react with lithium or manganese: an element which forms the oxide: or a compound comprising the element; and mixing, to thereby form granules.

2. A process for producing a cathode electroactive material for use in lithium ion secondary cells as claimed in claim 1, which process comprises sintering the granules in addition to forming granules.

3. A process for producing a cathode electroactive material for use in lithium ion secondary cells as claimed in claim 1, which process comprises, in addition to forming granules, sintering the granules by elevating the temperature of the granules from a sintering-shrinkage-initiating temperature to a temperature higher than the sintering-shrinkage-initiating temperature by at least 100°C at a rate of at least 100°C/minute; successively maintaining the elevated temperature

for one minute-10 minutes; and lowering the temperature to a sintering-initiating temperature at a rate of at least 100°C/minute.

4. A process for producing a cathode electroactive material for use in lithium ion secondary cells as claimed in claim 3, wherein the sintering is carried out by use of a rotary kiln.

5. A process for producing a cathode electroactive material for use in lithium ion secondary cells as claimed in claim 2, wherein at least one element selected from the group comprising of Bi, B, W, Mo, and Pb: the compound comprising the element; a compound comprising B_2O_3 and LiF; or a compound comprising MnF_2 and LiF is molten on the surfaces of particles of Li-Mn composite oxide so as to carry out the above described sintering process.

6. A process for producing a cathode electroactive material for use in lithium ion secondary cells as claimed in claim 1, wherein pulverized Li-Mn composite oxide with the spinel structure has an average particle size of 5 μm or less.

7. A process for producing a cathode electroactive material for use in lithium ion secondary cells as claimed in

claim 1, wherein pulverized Li-Mn composite oxide with the spinel structure has an average particle size of 3 μm or less.

8. A process for producing a cathode electroactive material for use in lithium ion secondary cells as claimed in claim 1, wherein granulation process is carried out through spray granulation, agitation granulation, compressive granulation, or fluidization granulation.

9. A process for producing a cathode electroactive material for use in lithium ion secondary cells as claimed in claim 1, wherein at least one organic compound selected from the group consisting of acrylic resin, an isobutylene-maleic anhydride copolymer, poly(vinyl alcohol), poly(ethylene glycol), polyvinylpyrrolidene, hydroxypropyl cellulose, methyl cellulose, cornstarch, gelatin, and lignin is employed as a granulation aid during granulation process.

10. A process for producing a cathode electroactive material for use in lithium ion secondary cells as claimed in claim 9, which process comprises binder removal process in air or in an oxygen-containing environment at 300°C to 550°C.

11. A cathode electroactive material for use in lithium ion secondary cells which is produced through a process as claimed in claim 1.

12. A paste for producing an electrode comprising a cathode electroactive material for use in lithium ion secondary cells, wherein the cathode electrode material predominately comprises Li-Mn composite oxide particles with a spinel structure and particles of the electroactive material have an average porosity of 15% or less, the porosity being expressed by the following equation:

$$\text{Porosity (\%)} = (A/B)\times 100 \qquad (1)$$

(wherein A represents a total cross-section area of pores included in a cross-section of one secondary particle, and B represents the cross-section area of one secondary particle).

13. A cathode electrode for a lithium ion secondary cell, in which the electrode comprises a cathode electroactive material for use in lithium ion secondary cells, wherein the cathode electrode material predominately comprises Li-Mn composite oxide particles with a spinel structure and particles of the electroactive material have an average porosity of 15% or less, the porosity being expressed by the following equation:

$$\text{Porosity (\%)} = (A/B)\times 100 \qquad (1)$$

(wherein A represents a total cross-section area of pores included in a cross-section of one secondary particle, and B represents the cross-section area of one secondary particle).

14. A lithium ion secondary cell equipped with a cathode electrode for a lithium ion secondary cell as claimed in claim 13.

15. A lithium ion secondary cell as claimed in claim 14, which is formed into a coin-shaped cell, a coil cell, a cylinder-shaped cell, a box-shaped cell, or a lamination cell.